



Christian County Radio Interoperability Plan

I. PURPOSE

To implement a system in which all needed public safety, public works, and special emergency response agencies can effectively communicate with each other during emergencies in Christian County and potentially corresponding counties within the surrounding states.

Previous disasters have shown that there were not enough common radio channels available to be assigned to the several incidents that were taking place simultaneously. Many responding public safety agencies did not all have the same interoperable radio channels installed in their radios, thereby, preventing immediate and effective communication between the responding public safety agencies.

Christian County recognizes the need to be able to communicate effectively and immediately with all of its public safety, public works, and special emergency response agencies, as well as those agencies in other jurisdictions that may arrive to assist us.

Therefore, be it jointly resolved by all agencies in Christian County that the following Radio Interoperability Plan will be implemented and that all Christian County agencies will adhere to the guidelines herein set forth. Be it also agreed, that all Christian County agencies shall conform to and adopt the National Incident Management System in its entirety.

II. SITUATION AND ASSUMPTIONS

A. Situation

1. Whether natural or man made, Christian County has the potential to be faced with a large scale disaster that would require the response of multiple agencies.
2. Christian County has many different emergency response agencies within the county.
3. Mutual aid agreements are in place between most of the response agencies.
4. Christian County has 2 E-911 dispatch centers in the county. It is of the utmost importance that these agencies communicate and cooperate in regards to interoperability and frequency assignment.
5. The Christian County Emergency Operations Center (EOC) has the ability to communicate over Amateur Radio frequencies and has the ability to send and receive digital packet information.

6. Christian County Emergency Management has a pool of Amateur Radio Operators to assist in communication in the event of a large scale disaster. The county also has the ability to call upon amateur radio operators outside the county to assist if needed.

B. Assumptions

1. In the event of a large-scale emergency, the Incident Management System will be utilized.
2. All agencies will utilize the Unified Command concept.
3. The E-911 dispatch centers will cooperate on assigning interoperable channels.

III. CONCEPT OF OPERATIONS

A. General

1. During incidents that involve more than one agency, an interoperable radio channel or channels depending on the magnitude, should be requested by the incident commander or unified command structure at the scene.
2. The E-911 dispatch center will assign the frequency or frequencies. The dispatch center will keep track of assigned frequencies and relay that information to the other E-911 dispatch center.
3. One channel can be assigned to be used as the main communication channel between the Incident Command Post and the dispatch center. During the incident, this channel will be secured and only traffic between the ICP and the dispatch center will be allowed.
4. As the Incident expands, Amateur Radio Operators can be utilized. Once the EOC is activated, an amateur radio operator can be placed at the Incident Command Post to communicate directly with the EOC. Amateur radio operators can also be utilized to staff other sector areas including but limited to: staging area, shelter areas, mass distribution sites.
5. If there is not Amateur radio operator at the Command Post, the EOC is activated, and the IC is communicating with the dispatch center, the dispatch center will communicate with the EOC via a message system with message runners.
6. Under the Unified Command Concept, the leaders of each agency will be at the Command Post. A dedicated communications officer at the ICP should relay all traffic from the incident site to the dispatch center.

7. For incident operations, the dispatch center may, upon the request of the Incident Commander/Unified Command, assign additional channels. These channels will be used primarily for the different sectors assigned by the ICP. These channels for on-scene operations should be the V-Tach mutual aid channels supplied by the State of Missouri.
8. When an incident of significant magnitude occurs, it will be necessary for mutual aid companies to backfill out of service county agencies. When these mutual aid companies are requested, the dispatch center will need to assign a channel to these responding agencies as well. Generally, the channels that would be used in this case generally would be the Fire and Law Mutual Aid channels. If the outside responding agencies have the capability, other Christian County channels may be assigned if available.
9. If the outside responding agencies do not have the ability to communicate with Christian County agencies, an amateur radio operator will be assigned to their company. This amateur radio operator will be the communications link for that company on assignment in Christian County.
10. When a significant incident occurs, the County's Emergency Operations Center (EOC) will be activated. The EOC can assist in frequency designation.

B. Preparedness Activities

Activities that need to be undertaken by each agency and department to ensure an interoperable environment and state and federal compliance.

1. All county agencies need to have in place a plan to replace all obsolete radio equipment with narrow band capable equipment.
2. All radios should conform to the Office of Domestic Preparedness recommendations on channels and display. At a minimum, radios should have at least an 8 character alpha-numeric display and at least 16 channels.
3. In order to afford a better environment for interoperability, company officers radios should have increased capacity. Company officers should have radios with at least 32 channels. Company officers will generally be assigned as sector and branch commanders and will need the ability to communicate on a larger number of channels.
4. Company officers in each department and agency need to be fluent in the Incident Management System and the Unified Command System. Departments need to insure that they have an adequate training program to address these needs.
5. All Public Safety, Public Works, and Local Government Agencies must sign and abide by the Missouri SIEC Memorandum of Understanding (MOU) to be allowed the use of the state issued interoperable channels.

6. All Public Service and Special Emergency Response Agencies must sign and abide by the local jurisdictions Radio Interoperability Plan to be allowed the use of the state issued interoperable channels.
7. Public Service and Special Emergency Response Agencies must apply for permission to use the interoperable channels and be approved by the local jurisdiction authority or their designated representatives.
8. A channel plan will be implemented by each jurisdiction to attempt to make each radio usable by any person that needs to use it during an emergency. A standardized channel listing countywide is not practical. This can be, however, be accomplished by each individual department. All department radios should be programmed exactly the same.
9. The state interoperable channels are designated V-TAC 1, V- TAC 2, V- TAC 3, V- TAC 4, V-CALL and MTAC. Each department radio will have these channels programmed in to their radios in the same position. Use of these channels is subject to the terms and conditions noted above and the attached MOU and conditions for use (see appendix 1).
10. All Public Safety, Public Works, and Local Government Agencies will draft a policy/resolution adopting the Nation Incident Management System (NIMS).
11. Each dispatch center and EOC needs to develop a system/display board to keep track of channels issued and available.

IV. RESPONSIBILITIES

A. All Public Safety, Public Works, and Local Government Agencies

1. Apply for permission to use the interoperable channels and be approved by the local jurisdiction authority or their designated representatives
2. Must sign and abide by the Radio Interoperability Plan
3. Draft a policy/resolution adopting the Nation Incident Management System (NIMS).
4. Purchase radios that are narrow band capable and have a plan to replace all obsolete radios.
5. Implement an intra agency channel usage plan.

B. E-911 Dispatch Centers

1. Develop a system to track channel usage and availability in the event of a large scale emergency.

C. County Emergency Management Agency

1. Maintain an adequate EOC facility with Amateur radio equipment.
2. Maintain a list of Amateur radio volunteers and adequate call up lists and procedures to alert these personnel.
3. Initiate an annual review of this plan among all responding agencies.
4. Assist departments with IMS and Unified Command System training.
5. Ensure an adequate message system between the EOC and dispatch center.

Appendices:

1. Channel conditions of use
2. Channel listing table
3. Complete list of countywide agency channels
4. State interoperability executive committee MOU

CONDITIONS FOR USE

FCC Designated Public Safety Interoperability Channels Below 512 MHz.

1. The frequencies shown above are available for assignment to Licensees under 47CFR90 to satisfy intermittent public safety incident response requirements. The frequencies are available on a shared basis and will not be authorized for the exclusive use of any one agency. Public Service entities may apply to the Missouri State interoperability Executive Committee on a case-by-case basis for permission to use these channels. Permission to access these VHF/UHF interoperability channels will only be granted to a public service entity when the application is to provide assistance and support to the public safety community in completing their mission. The Missouri SIEC recognizes the need for non-traditional responders to be integrated into incident management systems in order to operate in an effective manner. As such, local public safety entities may, through interlocal agreements, memoranda of understanding or other formalized contractual means, extend their use of these interoperability frequency resources to organizations with established relationships to facilitate emergency operations. Such organizations shall include Radio Amateur Civil Emergency Services (RACES) programs which are official units of and under the direct oversight of the governmental entity, American Radio Relay League (ARRL) sanctioned Amateur Radio Emergency Services (ARES) programs when acting in cooperation with and express approval of the governmental entity, Radio Emergency Associated Citizen's Teams (REACT) groups when acting in cooperation with and express approval of the governmental entity, locally organized search and rescue groups when acting in cooperation with and the express approval of the governmental entity, disaster relief organizations such as, but not limited, to the American Red Cross, Salvation Army Disaster Relief or other similar organizations who provide disaster relief or assistance. In all cases involving use by non-traditional responders, the governmental entity served shall be responsible for proper operation and control of communications equipment at all times, and shall take measures to insure operations abide by all applicable FCC Rules and Regulations. In all cases, non-traditional responders shall comply with all FCC type acceptance requirements. Use of modified frequency agile VHF and/ or UHF amateur radio transceivers within this plan is not authorized.

2. Mobile stations are permitted to utilize these channels for official activities facilitating the operations of their agencies. In all cases, priority shall be afforded to any agency with immediate operational needs to mitigate high impact incidents that threaten life, property or the environment. No one discipline, jurisdiction, agency or essential support function has precedence over another and full cooperation must be afforded during joint operations. Unified command under the Incident Missouri State Interoperability Executive Committee Memorandum of Understanding, March 2003 2nd revision Management System shall be implemented. The agency in control of the incident, as determined in the local Emergency Operations Plan per specific incident type, shall assign channels for the duration of a defined operational period as required for incident support operations. During this period, no non-participating station within range of the incident may cause interference to the operation. Given adequate geographic separation, coordinated co-channel operations at separate incidents and venues may be conducted if ERP is maintained to the absolute minimum required to maintain reliable communications at each incident. All users must understand the shared nature of these frequencies. While coordination and pre-planning is conducted to reduce the possibility of operational interference, ultimately, professional courtesy and cooperation is necessary at a local level to eliminate any immediate conflicts.

3. Temporary Base stations are authorized, under the State of Missouri Callsign WPWV749. This authorization allows eligible entities to use up to 25 VHF temporary Base Stations and 25 UHF Temporary Repeaters throughout Missouri while operating in a Crisis or Consequence Management environment. Eligible mobile stations, as defined in 47CFR90.20, are licensed through their agency's current Public Safety radio license in a blanket arrangement. In addition to the blanket eligibility, FCC Callsign WPWV749 also permits 1500 mobile/portable radios to operate on the VHF/UHF channels. The use of Fixed Base Stations is not currently authorized.

4. Initial contact shall be established using analog FM emission (11K2F3E). CTCSS will not be used on the calling channels to ensure access by stations from outside the normal area of operation.

5. Temporary Base stations are permitted, under authorization by Callsign WPWV749. The following restrictions apply: Temporary Base stations operating on TAC channels and the Missouri Common channel, "MTAC," must employ means to confine their signal to the minimum ERP necessary to support the intended use. Such means may include limited height, power output, antenna gain and antenna directional beam width.

Suggested on scene parameters are:

(a) Temporary Base Station equipment shall be limited to a maximum transmit antenna height of 6.1m, gain of 3.0 dBd and power output not to exceed 50 Watts measured at the antenna.

(b) Temporary base stations (FBT), and Temporary mobile relays (FB2T), that are field deployed within the licensee's operational area - or are operating at an incident under mutual aid conditions - may employ as much elevation and ERP as necessary to effectively support the incident for the duration of the operational period. Such stations must not be left in permanent operation and must be dismantled upon cessation of the incident. Missouri State Interoperability Executive Committee Memorandum of Understanding, March 2003 2nd revision

(c) Where permitted by Part 90, paired frequencies may be used for with temporary mobile relay facilities. Such mobile relay facilities shall employ CTCSS or NAC access and a time out timer limiting transmitter duration to no greater than 180 seconds (3 minutes).

6. In areas where RFI is a concern, CTCSS may be used on the TAC channels to mask interference. The standard region wide CTCSS shall be 156.7 Hz. All radio equipment in the region shall be programmed with CTCSS encoded on the transmit carrier whether the system operator intends for the equipment to be used in CTCSS or Carrier Squelch modes.

An example would be: VTAC1 - Rx 151.1375 CSQ/ Tx 151.1375 – 156.7 Hz.

7. Equipment, including temporary base stations, temporary control stations, mobiles and portables must be capable of toggled operation between CTCSS and Carrier Squelch mode if CTCSS has been employed as a means of reducing RFI. Should resources be brought in from outside of Region 24 for crisis or consequence management, it is likely these resources will not have the Region 24 CTCSS tone in their equipment. Deactivation of CTCSS on receivers would be necessary for these resources to participate under a unified command environment. It is anticipated the VHF simplex channels and UHF channel pairs listed above will be utilized in an Incident Management System/Incident Command System environment, with channel use assignment being made at the scene after the incident commander or designee determine the most efficient channel allotment to effect safety of life and property issues. By entering into an Memorandum of Understanding (MOU), the applicant certifies that their personnel, field, command and telecommunicators, has acknowledged the Incident Command

System/Incident Management System concept of command structure, the characteristics associated with it and will implement same at such time use of the interoperability channels is required. It is conceivable that some equipment in Region 24, operating under blanket licensing by the FCC, will be released into field operation without the Region 24 CTCSS and would require the user who employs CTCSS for RFI masking to employ Carrier Squelch to achieve interoperability. Momentary monitoring, such as that employed on non-exclusive frequencies (de - centralized trunking) to satisfy FCC requirements of listening for other use before transmitting is considered inadequate for the purposes of satisfying this condition for use. Should CTCSS be employed on TAC channels as an RFI masking solution, the applicant will provide an attachment addressed to Region 24 certifying all radio operators, including Telecommunicators and field response personnel: Missouri State Interoperability Executive Committee Memorandum of Understanding, March 2003 2nd revision

- (a) Have been trained in the differences between CTCSS and Carrier Squelch modes of operation,
- (b) Have understanding that resources outside of Region 24 may not use the Region 24 CTCSS tone, and,
- (c) Can demonstrate competent practical motor skills in reconfiguring their equipment so that it operates in Carrier Squelch receive mode for the operational period of the incident. Coordination will not be granted until this condition is satisfied.

8. Use of any CTCSS to mask co-channel operation by another authorized user is not permitted.

9. In cases where CTCSS is necessary to mask RFI and the RFI contains a component that breaks through the specified Region 24 CTCSS, an alternate CTCSS tone or CDCSS code may be specified on a case-by-case basis. Additional CTCSS tones and CDCSS codes shall be assigned only after approval of the Missouri SIEC and shall not be changed by the individual agency or the agency's communications vendor. In all cases, the equipment shall contain the capability to revert to Carrier Squelch operation as specified under Condition 7 of this section.

10. Digital modes are authorized on TAC channels after July 1, 2004 to allow adjacent wideband channel users time to migrate to narrowband operation. Digital format shall be "Project 25" Phase I compliant with a network access code of \$293. The implementation of additional Network Access Codes is not permitted. Radios programmed in digital operation should also be capable of operation in analog FM as specified in Conditions 4 and 6 of this section.

11. In order to alleviate confusion, standard mnemonics shall be used in all equipment to refer to individual channels. These are listed in the table above. Should the equipment not be capable of alphanumeric channel mnemonics, the radio should be placarded to indicate the channel mnemonic and its corresponding position on the radio's selector switch.

12. All stations not operating in mobile relay mode, where permitted, shall employ a time out timer set to limit transmission duration to a period of no greater than 60 seconds (1 minute).

13. All stations operating in mobile relay mode, where permitted, shall be configured to immediately drop transmit carrier upon cessation of input signal. Reasonable hysteresis time in squelching action of weak received signals, or in signals that have achieved a critical bit error rate (BER), is permitted. Prolonged "hang time" in excess of 500 ms is not permitted.

14. Alert paging and SCADA operations are not permitted on Calling or TAC channels. Temporary base station receivers shall not be muted by either selective calling alert mechanisms or DTMF signaling devices.

15. As a condition of coordination, the applicant will understand that in the time period up to January 1, 2005, adjacent channel users operating in 20 kHz channel width (wideband) are co-primary. The potential exists for interference from and with incumbent adjacent channel users. Per FCC limitations, after January 1, 2005, adjacent channel wideband operations will become secondary to proper interoperability traffic on the above listed channels.

16. The State of Missouri will offer frequency 154.680 MHz as a multi-discipline, multi-agency public safety common channel to all public safety agencies and other approved entities who adhere and sign the above Memorandum of Understanding with the Missouri State Interoperability Executive Committee (SIEC). The channel will be referred to as the MTAC channel. The operating parameters for this frequency are listed below: The statewide channel, 154.680 MHz, will have a designated CTCSS tone of 156.7 Hz. The guidelines established in sections 6,7,8 and 9 above will be used when implementing the MTAC channel. It will be utilized as an on-scene communication “*Common Channel*”, to promote interaction and coordination between agencies in areas as Incident Management/Incident Command is being implemented. It will be used as a “Mobile Only/Fixed Base Temporary” frequency, but will have the same FBT restrictions as listed in Section 5 above. With the exception of Section 4 (bandwidth limitation), the operational guidelines established for the VTAC/UTAC channels will apply to the “MTAC” channel. The Missouri Common Channel will be utilized with a bandwidth of 20K until June 30, 2005. Effective July 1, 2005, the common channel will use an emission designator no greater than 11K. The Missouri Common Channel will be referred to as “MTAC” while being used in plain voice inter-discipline/inter-agency communications. Frequency 154.680 MHz will be operated under a license held by the State of Missouri under callsign KA5824. There will be no individual agency licensing of this frequency. The Memorandum of Understanding (MOU) that each agency adheres to will be the standing agreement between the Missouri State Interoperability Executive Committee and the user agency. This agreement can be revoked if voted on and approved by a majority of the Missouri State Interoperability Executive Committee at either a special or general meeting.

Frequency MHz	Mnemonic	RX CTCSS	TX CTCSS	P25 NAC
155.7525 (nb)	VCALL	CSQ	CSQ	Not Auth.
151.1375 (nb)	VTAC 1	156.7 and/or CSQ	156.7	\$293
154.4525 (nb)	VTAC 2	156.7 and/or CSQ	156.7	\$293
158.7375 (nb)	VTAC 3	156.7 and/or CSQ	156.7	\$293
159.4725 (nb)	VTAC 4	156.7 and/or CSQ	156.7	\$293
154.680 (wb)	MTAC	156.7	156.7	Not Auth.
155.475 (wb)	Law MA	Not Auth.	Not Auth.	Not Auth.
154.280 (wb)	Fire MA	Not Auth.	Not Auth.	Not Auth.

Christian County Emergency Services Frequency List

Below is a listing of every frequency in Christian County that is authorized for use in emergency/disaster situations. Not all frequencies are listed here. There are some private channels that will remain unlisted for intra agency use.

This list is intended to be an aid in determining which channels should be included in your department's radio programming. In order to achieve an interoperable environment, each radio should have the maximum amount of channels installed. If channel capacity is limited, then use the maximum amount in your particular discipline and geographical area (fire/ems – law enforcement).

The use of these channels are subject to Standard Operating Procedures set forth by the County Communications Committee. Failure to comply with these SOP's could result in disciplinary action.

Law Enforcement	Receive	Transmit	Dec	Enc
1. V-Tach 1	See	Above		
2. V-Tach 2	See	Above		
3. V-Tach 3	See	Above		
4. V-Tach 4	See	Above		
5. Law Mutual Aid	155.475	155.475		
6. All Sheriff's	155.73	155.73		
7. Ozark PD North Repeater				
8. Ozark PD South Repeater	155.7	153.74	179.9	179.9
9. Ozark PD South Tach				
10. Nixa PD Dispatch				
11. Nixa PD Tach 1				
12. CC Sheriff East Repeater	153.95	155.852		
13. CC Sheriff Central	151.1675	151.168		
14. CC Sheriff West Repeater	154.755	156.21		
15. CC Sheriff County Wide Tach	155.565	155.565		
16. Fire Mutual Aid	154.28	154.28		
17. Fire East Repeater (Chadwick / Sparta)	154.055	155.55		
18. Fire East Tach				
19. Ozark Fire Repeater	154.37	153.785	167.9	167.9
20. Ozark Fire Tach				
21. N. Stone Co. Repeater(Hildville-Clever)	151.46	159.39	110.9	110.9
22. Highlandville Private				
23. Clever Fire Private Repeater				
24. Nixa Fire Repeater				
25. Nixa Fire Tach				
26. West Fire Repeater (Billings Fire)	159.3975	154.785		
27. West Fire Tach				
28. CC Road-Bridge East Repeater				
29. CC Road-Bridge West Repeater				
30. Cox CC Ambulance	155.205	155.205	123	123
31. St. Johns Ambulance	155.235	155.235	151.4	151.4
32. Weather	162.4	162.4		

Fire Service	Receive	Transmit	Dec	Enc
1. V-Tach 1				
2. V-Tach 2				
3. V-Tach 3				
4. V-Tach 4				
5. Fire Mutual Aid	154.28	154.28		
6. Fire East Repeater (Sparta-Chadwick)	154.055	155.55		
7. Fire East Tach				
8. Ozark Fire Repeater	154.37	153.785	167.9	167.9
9. Ozark Fire Tach				
10. Highlandville Fire Private				
11. North Stone Repeater				
12. Clever Fire private repeater				
13. Nixa Fire Repeater				
14. Nixa Fire Tach				
15. Fire West Repeater (Billings)	159.3975	154.785		
16. Fire West Tach				
17. Law Mutual Aid	155.475	155.475		
18. All Sheriff's	155.73	155.73		
19. Ozark PD North Repeater				
20. Ozark PD South Repeater				
21. Ozark PD South Tach				
22. Nixa PD Dispatch				
23. Nixa PD Tach 1				
24. CC Sheriff East Repeater	153.95	155.852		
25. CC Sheriff Central(simplex)	151.1675	151.168		
26. CC Sheriff West Repeater	154.755	156.21		
27. CC Sheriff County Wide Tach	155.565	155.565		
28. CC Road-Bridge East Repeater				
29. CC Road-Bridge West Repeater				
30. Cox CC Ambulance				
31. St. Johns Ambulance	155.235	155.235	151.4	151.4
32. Weather				

SUBJECT: Memorandum of Understanding for agencies to operate FCC designated VHF/UHF multi-discipline interoperability channels in accordance with Missouri State Interoperability Executive Committee guidelines:

This memorandum of understanding (hereafter referred to as MOU) shall be submitted by _____ (hereafter referred to as APPLICANT) representing a public safety agency indicating compliance and agreement with the attached operational and technical guidelines for the use of the FCC designated VHF/UHF multidiscipline interoperability channels. By virtue of signing and submitting this MOU, APPLICANT affirms its willingness to comply with the proper operation of the interoperability channels as dictated by the Missouri State Interoperability Executive Committee (SIEC).

The APPLICANT shall abide by the conditions of this MOU, which are as follows:

- To operate by all applicable Federal, State, County, and City laws/ordinances.
- To utilize “plain language” for all transmissions.
- To monitor the Calling Channel(s) at an incident and coordinate the use of the Tactical Channels.
- To identify inappropriate use and mitigate the same from occurring in the future.
- To mitigate contention for channels by exercising the Priority Levels identified in this MOU.
- To share channels between all qualified public safety entities without respect to discipline and not monopolize the use of any channel.

The preceding conditions are some of the primary requirements for operation of these interoperability channels. They are not a complete list and applicants are referred to the complete SIEC guidelines (attached) for the complete list of operational and technical requirements.

The applicant agency will use these interoperability channels with _____ (number of mobile/portable units) and will notify the Missouri State Interoperability Executive Committee if the number of radios programmed increases by more than 10% of the number of units listed above.

Priority Levels:

1. Disaster or extreme emergency operation for mutual aid and inter-agency communications;
2. Emergency or urgent operation involving imminent danger to life or property;
3. Special event control, generally of a preplanned nature (including Task Force operations)
4. Joint training evolutions (these channels do not qualify for use by single agencies for their secondary communications purposes)

To resolve contention within the same priority, assuming all radio equipment is exercising the lowest output and effective radiated power level practicable, the channel should go to the organization with the wider span of control/authority. This shall be determined by the SIEC for the operation or by the levels of authority/government identified in the contention. For clarification purposes, and as an aid to facilitate inter-agency on scene communications, any fixed base or mobile relay stations utilized for temporary locations (FCC station class FBT or FB2T, respectively), shall, in order to be consistent with SIEC guidelines, utilize power levels sufficient to effect the necessary operation.

Federal agencies are permitted access to interoperability channels only as authorized by 47 CFR 2.102 (c) & 2.103 and Part 7.12 of the NTIA Manual. Federal agencies must also adhere to the operating parameters established in the attached SIEC guidelines.

Any violation of this MOU or FCC Rule shall be addressed immediately. The first level of resolution escalation shall be between the parties involved, next the SIEC, and finally the FCC.

Chairperson,
Missouri State Interoperability Executive Committee

Date

Applicant/Agency

Date